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INCOME INEQUALITY IN CANADA 1965-1983

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Income inequality in Canada has not changed significantly over the past two decades, though this apparent stability may be surprising in view of the major economic and social changes that occurred over this period. The share of income going to the bottom quintile remains at about four percent while the top quintile continues to receive about 40 percent of income.

Social trends such as lower fertility rates have coincided with increased female labour force participation to increase family incomes in the middle and upper-middle parts of the income spectrum. At the same time, the trend for baby boom children to establish their own separate households, and increased divorce and separation rates, have tended to create more small family units with low incomes. These social trends, in isolation of other factors, would have increased income inequality.

However, economic factors have apparently offset these tendencies. Since employment income is concentrated in the middle and upper-middle ranges, the relative fall in this source of income over the past two decades tended to be equalizing. Similarly, the fact that a large part of total investment income accrues to the elderly who have below average income implies that the trend towards high interest rates has been equalizing. Finally, the social "safety nets" put in place in the mid-1960s and early 1970s have grown in relative importance, and this too has had an equalizing impact on the distribution of income.

Given the overall stability in income inequality, the equalizing tendencies of *economic* factors such as high interest rates and relatively slow economic growth, with the large automatic responsiveness of governments' social safety net programs, appear to have just about exactly offset the disequalizing *social* factors of "baby boomers" leaving home, lower fertility, higher divorce and separation rates, and higher female labour force participation.

> "Economics consists of theoretical laws which nobody has verified and of empirical laws which nobody can explain."
>
> attributed to Michael Kalecki by Josef Steindl (1965)

INTRODUCTION

The conventional wisdom in Canada is that income inequality has not changed at all since the Second World War. When data are used to support this contention, it is frequently observed that the share of income going to the bottom 20 percent of the population (the bottom quintile) is about 4 percent while the amount received by the top quintile is about 40 percent, and neither figure has changed significantly over time.

This apparent stability in the distribution of income is surprising in view of the major economic and social changes that have occurred. For example the scope of government transfer payments has increased very substantially as has

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female labour force participation. The macro economy has gone through major changes from relatively sustained growth to "stagflation" and now to very high levels of both unemployment and real interest rates.

In this context, the apparent stability of the Canadian size distribution of income may be explained by two alternative (but not necessarily mutually exclusive) hypotheses:

1. The conventional indicators of income inequality such as quintile shares and the Gini coefficient are not sufficiently sensitive to changes in the shape of the income distribution, and thus have obscured significant changes over time; and/or
2. The many important socio-economic changes in recent decades have somehow turned out to be almost entirely offsetting in terms of their impact on overall income inequality.

The principal objective of this paper is to determine whether either of these hypotheses has any support.

A further objective is to determine whether various particular changes in recent years such as "unbundling" of households and high nominal interest rates have tended to have an equalizing or disequalizing impact on the distribution of income. For example, one generally held view is that economic factors such as high unemployment rates have been particularly hard on the poor, so that the recent increase in unemployent rates is disequalizing (Blank and Blinder, 1985). Similarly, another generally held view is that poverty rates would be much higher if so many women were not working to help support their families, and further that increased female labour force participation has been equalizing (Horner and MacLeod, 1980).

Data

The analysis to address these questions is based almost entirely on, and thus circumscribed by, a series of annual income distribution surveys. These are the Surveys of Consumer Finance (SCF) now carried out annually by the Household Surveys Division of Statistics Canada. Six surveys spanning the period from 1965 to 1983 (with intervening years 1971, 1975, 1979, and 1982) have been drawn upon. 1965 is the earliest year the SCF covered the entire population, not just urban areas, while data on 1983 incomes are the most recent available.

The survey is based on a complex sample design with households as the basic unit. However within each household, income data for all individuals age 15 or over are collected, as are family relationships. For purposes of this analysis, a consistent set of computer micro-data tapes were assembled where the basic income recipient unit was the census family—unattached individuals and parent(s) living with never-married children.

The income information in the surveys is, of course, subject to the well known problems of non-response and under-reporting (for example see *Statistics Canada*, 1985), and the reader is cautioned to bear this in mind when interpreting the results. As well, the data are subject to a range of conceptual limitations. In 1965, no information was collected on income taxes paid. More generally, no data are available on net imputed rent or accrued investment income even though

these are clearly important (e.g. see Weisbrod and Hanson, 1969; Wolfson, 1979). Finally, it is sometimes argued that lifetime income or consumption are more appropriate indicators of economic well-being than annual after-tax income. While there is some conceptual merit in this view, such indicators are beyond the available data and the scope of this paper.

Basic Observations

The starting point in this analysis is shown in Chart 1 which plots the five quintile shares of the distribution of total money income over the period 1965

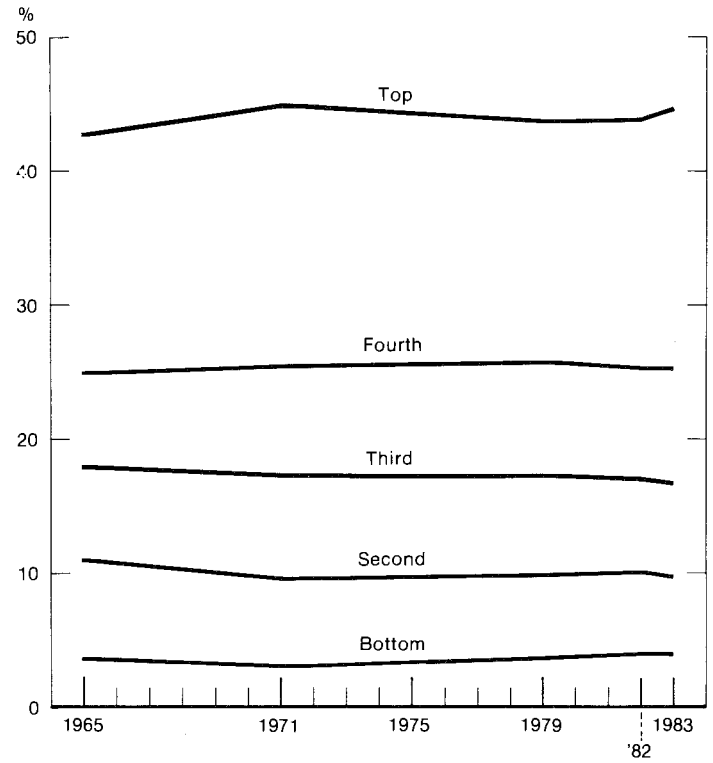


Chart 1. Income Inequality Trends, Quintile Shares, Census Families (Six Years)

to 1983. (While this chart shows only data for six years, it would look virtually identical if data for all available years were plotted.) The share of the bottom quintile varies over a range of one percentage point while that for the top quintile varies over a range of two percentage points, neither showing any particular trend. There is no absolute standard to judge whether the plot shows "surprising" stability of the income shares over time, or significant trends or fluctuations. Thus, to provide a comparative basis, Tables 1 and 2 and Chart 2 present related time series over the same period.

The changing age structure of Canadian census family units is shown in the top part of Table 1. The population has been divided into four groups based on the age of the eldest of the family head and spouse if present, "young" (under

TABLE 1

POPULATION TRENDS: AGE, FAMILY TYPE AND EFFECTIVE LABOUR FORCE PARTICIPATION, CANADA

(Percentage distribution)

	Year					
	1965	1971	1975	1979	1982	1983
Age of Head						
Young	8.3	11.3	11.9	11.2	9.8	8.8
Early Middle	39.5	38.2	39.9	40.7	42.5	42.3
Late Middle	34.5	31.9	29.3	29.1	29.2	29.7
Elderly	17.8	18.5	18.9	18.5	18.5	19.1
Family Type by Effective Labour Force Participation						
Unattached individuals	27.2	32.0	35.5	35.3	34.3	34.2
No earners	11.2	13.9	14.8	13.9	13.9	14.5
Primary	16.0	18.1	20.7	21.4	20.4	19.7
Married Couples	18.0	18.9	20.0	19.5	20.7	20.6
No earners	3.8	4.4	4.8	4.9	5.7	5.8
Primary	8.3	6.8	6.3	5.7	5.6	5.6
Modern	6.0	7.7	8.9	8.9	9.4	9.2
Married Couple with Children	49.0	43.2	38.9	37.9	37.0	37.5
No earners	0.9	1.3	0.9	0.8	0.9	1.1
Primary	21.1	20.0	15.2	12.3	10.6	10.5
Modern	8.5	10.6	11.8	13.1	13.6	14.4
Primary plus	12.9	6.5	5.6	5.1	4.6	4.4
Modern plus	4.9	4.0	4.6	5.7	6.3	6.0
Children only	0.7	0.8	0.8	0.9	1.0	1.0
Single Parent Families	5.7	5.9	5.7	7.2	8.0	7.8
No earners	1.3	1.9	1.5	1.7	2.1	2.2
Primary	1.4	1.3	1.9	2.6	3.0	2.9
Primary plus	1.1	1.1	1.1	1.4	1.6	1.4
Children only	1.8	1.6	1.1	1.5	1.2	1.2
Effective Labour force Participation						
No Earners	17.2	21.5	22.1	21.3	22.6	23.5
Primary	46.8	46.2	44.0	42.1	39.7	38.8
Modern	14.5	18.3	20.7	22.0	23.0	23.7
Primary Plus	14.0	7.6	6.7	6.6	6.2	5.8
Modern Plus	4.9	4.0	4.6	5.7	6.3	6.0
Other	2.5	2.5	1.9	2.3	2.2	2.3

TABLE 2

INCOME COMPOSITION TRENDS, PERCENTAGE SHARES OF TOTAL FAMILY INCOME

	Year					
Income Source	1965	1971	1975	1979	1982	1983
Employment	88.6	86.1	84.2	83.1	77.9	78.7
Investment	3.6	4.7	4.4	6.0	8.0	6.6
Other	1.6	2.4	2.2	2.5	3.2	3.3
Market	93.9	93.2	90.8	91.6	89.1	88.6
Transfers	6.1	6.8	9.2	8.4	10.9	11.4
Total Money	100.0	100.0	100.0	100.0	100.0	100.0
Income Tax	N/A	15.2	14.6	15.1	15.5	15.9
Disposable	N/A	84.8	85.4	84.9	84.5	84.1

25), "early-middle" (25-44), "late middle" (45-64), and "elderly" (65 or over). The main feature is the post-World War II baby boom cohort establishing themselves as independent "young" family units in the 1965 to 1975 period, and then moving into "early middle" age in the next decade.

More significant demographic changes are indicated in the middle of Table 1. Here, family units have been divided into groups of unattached individuals, couples without children, couples with children, and single parents. The baby boomers left home in the period 1965 to 1975 (the family "unbundled") causing an increase in the proportion of unattached individuals.[1] This, coupled with a sharp drop in fertility rates (from a high of 3.9 in 1959 to 3.1 in 1965 down to 1.7 in 1983), accounted for a one-quarter drop in the proportion of family units that were traditional husband-wife families with children. Finally, the increased rate for divorces and separations is reflected in the one-third increase in the proportion of single-parent families.

Turning to macro-economic trends, Charts 2.1 and 2.2 present five basic indicators. Roughly speaking, the 1965 to 1983 period in Canada can be divided into three phases. First, from 1965 to the early 1970s is the close of the post-war golden growth years. Real economic growth was strong, unemployment and inflation rates were low, and real interest rates were "reasonable". The next phase, from the mid to the late 1970s, was one dominated by accelerating inflation and low, even negative, real interest rates. Economic growth slowed but generally remained positive, while real average wages fell. The most recent period has been one of decelerating inflation, recession, and unusually high real interest rates.

These changes in the macro-economy have been reflected in the sources of income of Canadian family units as shown in Table 2. The strong economic growth through the end of the 1960s was the backdrop for major expansions in Canada's welfare state programs—old age pensions, unemployment insurance, social assistance (i.e. welfare), and the automatic indexing of many benefit levels as well as the personal income tax system, though these improvements were largely in place by the early 1970s. Increases in the unemployment rate in the 1978 to 1982 period are linked to decreases in government transfer payments, particularly unemployment insurance and welfare. High nominal interest rates are associated with larger shares of investment income. At the same time, personal income taxes as a proportion of total money income showed very little change.

(The macro-economic trends shown in Charts 2.1 and 2.2 and their relationship to trends in income inequality are discussed at greater length in the penultimate section below.)

One of the most dramatic changes over the last two decades has been the increase in female labour force participation. This is shown in the middle and bottom portions of Table 1 where the four family types have been further disaggregated by an indicator of the effective labour force participation (ELFP) of various family members. An individual or family member was considered an ELF participant if the absolute value of their employment income exceeded 2.5

[1]The phenomenon of "unbundling" is not fully captured in these data, particularly for the elderly. The census family concept which has been used is much closer to the idea of the nuclear rather than the extended family, so that even if they live in the same dwelling with their married children, the elderly would be treated as separate census families.

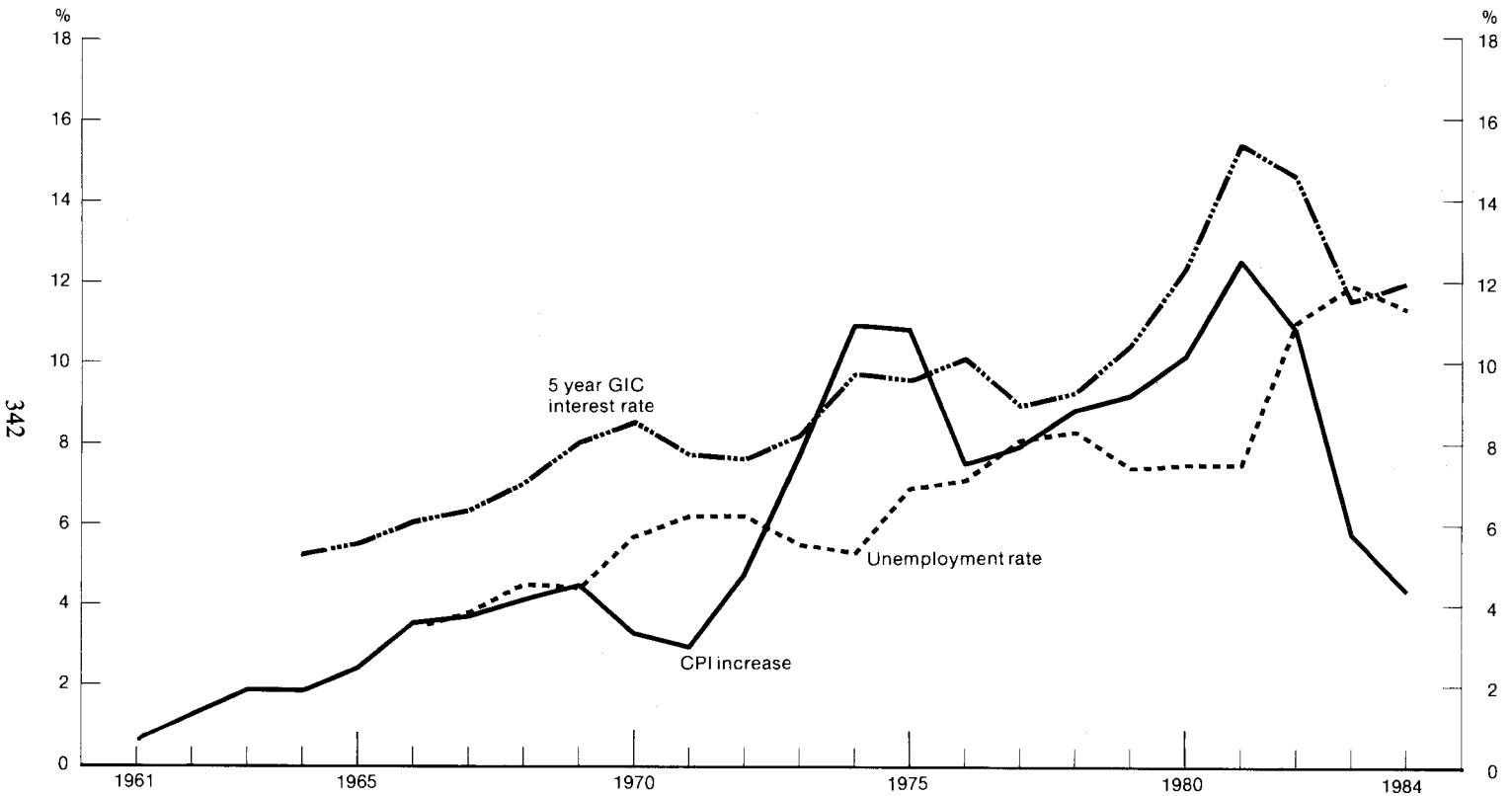


Chart 2.1. Macroeconomic Trends

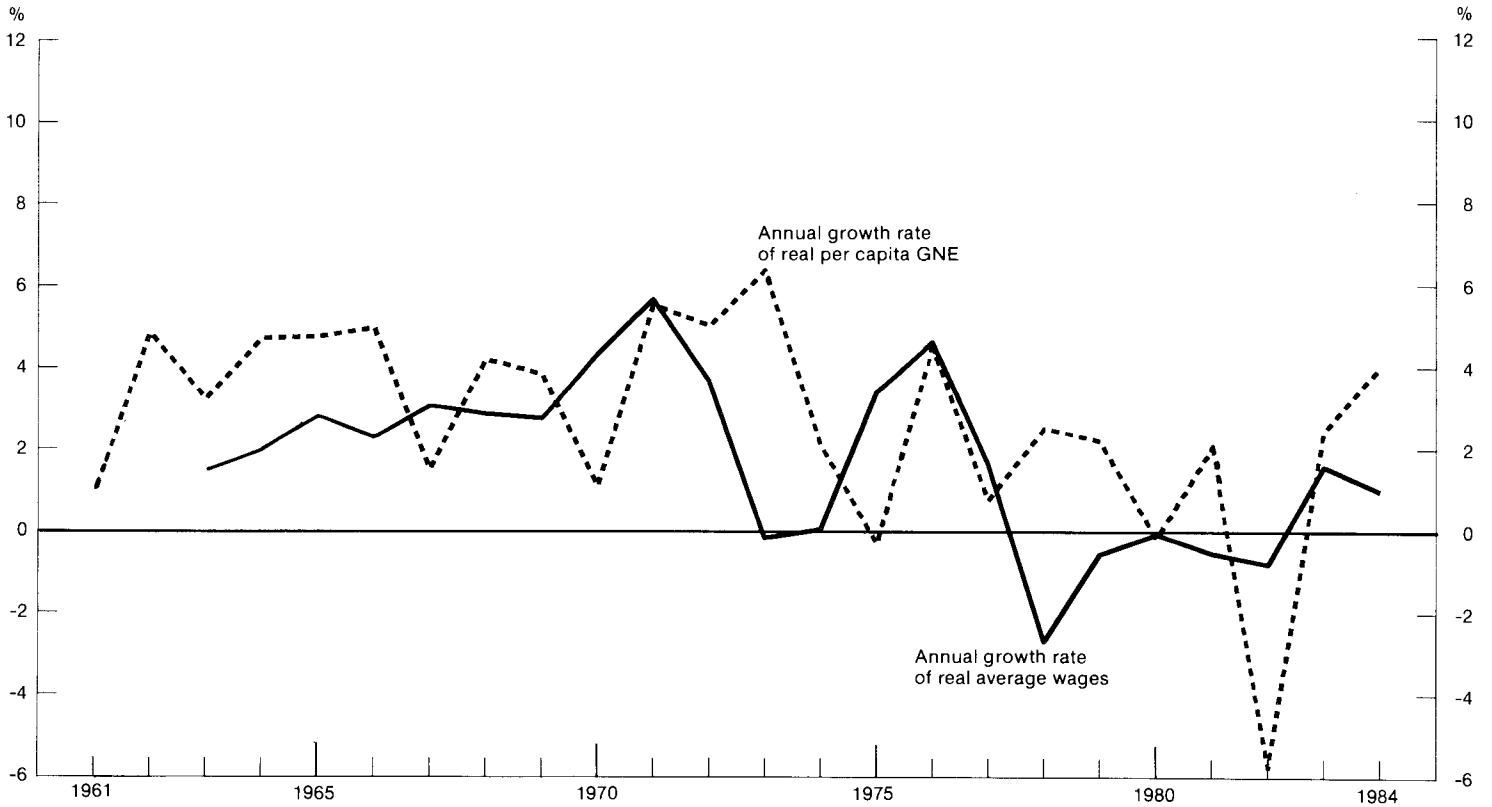


Chart 2.2. Macroeconomic Trends.

percent of the average industrial composite wage in the year (i.e. about one week of full-time average-paid work). Note that the ELFP concept is *not* the same as the more usual definition of labour force participation. For example, an individual could have been unemployed all year and hence in the labour force but would not be counted as an ELF participant.

Based on this ELFP criterion, family units were divided into as many as six groups, depending on the type of family:

No Earners	No family members were ELF participants;
Primary	the head or spouse if present but no other family member was an ELF participant;
Primary Plus	Either the head or spouse but not both and at least one child was an ELFP;
Modern	Both the family head and spouse but no one else were ELFPs;
Modern Plus	Both the family head and spouse and at least one child were ELFPs; and
Children Only	Only one or more children were ELFPs.

Particularly amongst married couples with children, the proportion of "primary" families dropped by more than half while the proportion of "modern" families increased by more than 50 percent.[2] Similar trends are evident for couples without children.

In view of the sometimes dramatic trends and fluctuations over the past two decades in the demographic structure and ELFP of Canadian families, and in the macro-economy, the apparent stability of the quintile shares in Chart 1 may well be considered surprising.

Measurement Concerns

There are several reasons why the relative stability of the quintile shares shown in Chart 1 and the implied level of income inequality may be more apparent than real. The first is the obvious point that quintile shares are *not* sensitive to changes in the size distribution of income within each quintile. For example, it can be shown that the share of the top 5 percent (the top "vingtile") could be anywhere between 11 and 26 percent and still be consistent with the quintile shares in Chart 1.

Inequality is a difficult concept to formalize. One approach developed, among others, by Atkinson (1970), Sen (1973), Love and Wolfson (1976), and Shorrocks (1980) and applied more recently by Cowell (1984) is an axiomatic one. This approach starts by specifying a set of basic conditions or axioms that an acceptable inequality measure must obey. For example, the measure should respond smoothly to small changes in the distribution; it should be anonymous; and it should be scale independent—it should make no difference to measured inequality whether

[2]The author's spouse has suggested that more fitting labels rather than "primary" and "modern" would be "anachronistic" and "pre-modern" respectively. This accords with Illich (1982) who argues that the "traditional" husband earning/wife at home family represents an unequal division of family labour that is of recent origin, tied to the rise of industrial market economies. The pre-modern term reflects the fact that even in supposedly modern two-earner couples, most unpaid housework is still done by the wife.

income is measured in one or five dollar units, nor if population is measured in numbers of family units or fractions of total population. Quintile shares and the Gini coefficient satisfy all these conditions.

The one key further widely accepted condition is the Pigou-Dalton Condition of Transfers. This condition requires that if one higher income unit gives a small amount of their income to a lower income unit, measured inequality must decline. This condition is formally equivalent to the post-transfer Lorenz curve being at least somewhere closer to the 45° line and everywhere else coincident with the pre-transfer Lorenz curve. While this condition is not particularly controversial,[3] quintile shares as just noted do not satisfy it, though they never show opposite results. The variance of logarithms, however, violates the Condition of Transfers.

For precision, we use the term inequality measure for statistics like the Gini coefficient that strictly satisfy the Condition of Transfers, and the Term inequality indicator for statistics like quintile shares which never violate the condition but may show no difference between two distributions even if one Lorenz curve is clearly closer to the 45° line.

Beyond this, the concept of strength of transfer developed in Love and Wolfson has been employed to choose three different inequality measures which are relatively most sensitive to changes in inequality in the lower, middle, and upper ranges of the income spectrum—the exponential measure (EXP), the Gini coefficient, and the coefficient of variation (CV) respectively.[4] If in comparing two distributions all three of these measures move in the same direction, then it is likely that the associated Lorenz curves do not cross; if the three measures do not agree in their ranking then it is certain the Lorenz curves do cross.

Another issue related to the measurement of inequality is, in the terminology of Love and Wolfson, the ordering principle. Usually, income distribution statistics are based on the distribution of family units (i.e. unattached individuals and families) by total family income. However, one could just as easily use distributions of *per capita* incomes over family units or over individuals. The analyses in Wolfson (1979) and Cowell (1984), for example, indicate that the choice has a significant impact on measured inequality.

For this reason, two ordering principles have been used in this analysis. The first is the conventional total family income by family unit. The second is total family income per equivalent adult unit (EAU) by family unit. This second

[3]However, as noted in Love and Wolfson, appendix 3 (1976), measures satisfying the condition of transfers and showing increased equality would be consistent with increasing alienation or polarization as a uni-modal income distribution became bi-modal via a sequence of equalizing Pigou-Dalton transfers.

[4]The exponential measure is simply:

$$\frac{1}{n}\sum_{i=1}^{n} e^{-y_i}$$

for n incomes y_i with mean 1. This measure has the advantage over other "bottom sensitive" measures like the Theil-Entropy or Theil-Bernouilli measures that it is well defined for zero and negative incomes. Such incomes are fairly common and legitimate in actual microdata. The CV is the squared coefficient of variation, again for n incomes y_i with mean 1 this is:

$$\left[\frac{1}{n}\sum_{i=1}^{n}(y_i-1)^2\right]-1$$

Note that the CV is the most "top sensitive" measure used by Cowell (1984).

ordering principle takes rough account of the economies of scale widely presumed to obtain in family living, and reflected in Social Assistance benefit levels and the differentiation of poverty lines by family type. To determine the number of EAUs in a family, the first person is counted as one, the second as 0.67, and 0.33 for the third and subsequent family members (all of whom are children since the census family concept is being used). Thus a couple with two children is treated as 2.33 EAUs and if their income is $46,600, they would be treated as one family unit with an income of $20,000 under the second EAU-based ordering principle.[5]

A third concern is the choice of total money income as the income concept. It is becoming increasingly difficult to distinguish government transfers to individuals and tax expenditures in the personal income tax system, particularly with the advent of refundable income tax credits. Thus, it would be better to examine trends in the distribution of after-tax income. Ideally, at least payroll taxes among other taxes should also be taken into account but the data are not available. Alternatively, trends in the inequality of pre-government or "market" income (as defined in Table 1) are also of interest. Due to the lack of income tax data for 1965 on the one hand and the importance of the shifting role of government transfers on the other, the total money income concept is the one that will generally be used.

A fourth and frequently neglected concern is sampling variability. For example, based on the analysis in Love and Wolfson (1976, Appendix 2), twice the standard error in the Gini coefficient would range from 0.008 overall to 0.026 for about a 10 percent sub-group of the sample. This in turn suggests that a 95 percent confidence interval would be on the order of ±2 percent for the whole sample, and more than ±5 percent for smaller sub-groups. The CV is much more variable because of its relative sensitivity to the tails of the distribution, the fact that the upper tail in particular is significant (i.e. income distributions are characteristically positively skewed), and the fact that the estimates of this upper tail are not very reliable because the samples were not stratified by any significant correlate of income. These same considerations affect the top quantile shares.

Stasis in Income Inequality?

Table 3 shows the sensitivity of the results in Chart 1 to these various measurement concerns. The first three parts of the table give a range of inequality statistics for three different income concepts—market income, total money income, and after-tax disposable income respectively. These are all for the conventional ordering principle of total family income by family unit. The fourth part of the table is based on the total money income concept as in part a, but uses the other EAU-based ordering principle—family income per equivalent adult unit by family unit. In all four parts of the table, three inequality measures and

[5]This method of computing EAUs is clearly arbitrary, in the interest of clarity of exposition and because a more rigorous and non-controversial approach does not appear to exist. Cowell (1984) prefers the ordering principle where the example in the text would be treated as five income recipient units each with an income of $20,000. While there is certainly substantial income sharing within families, this ordering principle, or even one that would treat this situation as 2.33 units, would seem to contribute too much spurious equality.

the top decile and vingtile shares are shown in addition to the basic five quintile shares.

The statistics in the first four parts of Table 3 have been rounded to a rough estimate of the maximum number of digits likely to be statistically significant at the 95 percent level. (We mention this because the academic literature still often shows tables with more digits than can possibly be supported by the underlying data.) As a further check, part e of Table 3 shows the effect on measured inequality of simply dropping the top 5 family units and then recomputing all the inequality measures and indicators. Particularly for the CV, it appears that the rounding in the top four parts of the table is an insufficient indication of reliability. Deleting even a single observation in 1983 or 1971 (not shown in the table) causes the CV to drop by over 15 percent; one significant digit at most thus seems justifiable. For the other inequality statistics, probably two digits can be considered significant.

To highlight the key trends and patterns in Table 2, Chart 3 contrasts the three income concepts and two ordering principles for each of the three inequality measures. The absolute extent of measured or indicated inequality does indeed vary in the expected way. The EAU-based ordering principle shows systematically more equality than the conventional family income per family unit approach to constructing income distributions. As well, market or pre-transfer income is the most unequally distributed, while disposable or post-tax and post-transfer income is most equally distributed (all using the conventional ordering principle). The equalizing impact of government transfers appears greater than that of personal income taxes, particularly in the lower and middle income ranges. This is evident in Chart 3 from the somewhat wider gap between the Market and Total Money Income curves than between the Total Money and Disposable Income curves for the EXP and Gini measure—the inequality measures respectively most sensitive to inequality in the lower and middle income ranges—though the CV also shows this pattern.

More importantly from the perspective of this analysis, all four combinations of income concept and ordering principle and all inequality measures and indicators show a similar time profile. Inequality rises from 1965 to the early 1970s, drops to a low in 1979 or 1982, and then increases to 1983, though the "peaks" and "valleys" are not completely uniform in their timing. Also, market income shows some trend toward increasing inequality which must have been offset by government transfers since the trend in total money income inequality is closer to being flat. However, the peaks generally correspond to the years shown in the bottom part of Table 3 where high income "outliers" had the greatest impact. Also, it should be noted that the origins of the vertical axes in Chart 3 are not at zero, so that the apparent fluctuations in inequality are accentuated.

The overall conclusion must be equivocal. Certainly the EXP and Gini inequality measures in Table 3 and Chart 3 appear to show some small but significant variations over time. The CV shows greater variation, but this may still be more apparent than real due to sampling variability in the upper tail of the income distribution to which it is particularly sensitive. The quintile shares in Chart 1 look remarkably stable. On balance, it may be concluded that the

TABLE 3

INCOME INEQUALITY TRENDS, SHARES AND MEASURES FOR THREE INCOME CONCEPTS, TWO ORDERING PRINCIPLES, AND TRUNCATION OF TOP 5 INCOMES

Year	Mean ($)	Income Share within Quintiles					Top Decile Income Share	Top Vingtile Income Share	Inequality Measures		
		First	Second	Third	Fourth	Fifth			EXP	Gini	CV
a. Total Money Income Per Family Unit											
1965	5,310	3.6%	10.9%	17.9%	24.9%	42.7%	26.2%	16.2%	0.454	0.393	0.67
1971	8,118	3.0%	9.5%	17.3%	25.4%	44.9%	28.0%	17.5%	0.467	0.426	1.01
1975	12,747	3.3%	9.7%	17.2%	25.6%	44.2%	27.1%	16.5%	0.463	0.416	0.69
1979	18,798	3.6%	9.8%	17.2%	25.7%	43.6%	26.4%	15.8%	0.459	0.407	0.64
1982	26,066	4.0%	10.0%	17.0%	25.2%	43.8%	26.8%	16.1%	0.459	0.404	0.70
1983	27,245	3.9%	9.6%	16.7%	25.2%	44.6%	27.3%	16.6%	0.466	0.413	0.79
b. Total Market Income Per Family Unit											
1965	4,984	1.1%	10.3%	18.2%	25.7%	44.7%	27.6%	17.0%	0.475	0.437	0.80
1971	7,565	0.5%	8.1%	17.5%	26.5%	47.4%	29.6%	18.6%	0.493	0.478	1.22
1975	11,572	0.5%	8.0%	17.3%	26.8%	47.4%	29.2%	17.9%	0.493	0.478	0.89
1979	17,212	0.7%	8.3%	17.4%	26.9%	46.7%	28.4%	17.0%	0.488	0.468	0.82
1982	23,227	0.7%	7.9%	16.9%	26.6%	47.9%	29.4%	17.8%	0.497	0.480	0.96
1983	24,133	0.5%	7.2%	16.5%	26.7%	49.1%	30.3%	18.5%	0.509	0.495	1.08

c. Total Disposable Income Per Family Unit											
1965	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1971	6,888	3.4%	10.4%	17.9%	25.6%	42.6%	25.9%	15.7%	0.456	0.398	0.77
1975	10,887	3.8%	10.7%	17.8%	25.6%	42.1%	25.3%	15.0%	0.452	0.388	0.56
1979	15,966	4.2%	10.8%	17.8%	25.6%	41.6%	24.8%	14.5%	0.448	0.380	0.52
1982	22,020	4.6%	11.1%	17.6%	25.1%	41.6%	25.1%	14.8%	0.451	0.375	0.56
1983	22,917	4.6%	10.7%	17.3%	25.1%	42.3%	25.5%	15.2%	0.460	0.382	0.60
d. Total Money Income Per Equivalent Adult Unit											
1965	2,770	5.0%	11.4%	17.4%	24.3%	41.9%	25.7%	15.6%	0.445	0.371	0.57
1971	4,430	4.3%	10.5%	17.0%	24.5%	43.8%	27.3%	17.0%	0.456	0.399	0.92
1975	7,174	4.9%	11.2%	17.7%	24.7%	41.6%	25.3%	15.3%	0.445	0.371	0.55
1979	10,812	5.1%	11.2%	17.7%	24.7%	41.2%	24.9%	14.9%	0.442	0.366	0.57
1982	15,150	5.5%	11.2%	17.2%	24.3%	41.7%	25.4%	15.3%	0.445	0.366	0.60
1983	15,753	5.4%	11.0%	16.9%	24.3%	42.4%	26.0%	15.8%	0.451	0.373	0.63
e. Total Money Income Per Family Unit Excluding Top 5 Observations (percent change in statistics in a. above)											
1965	NA	0.7%	0.7%	0.6%	0.7%	−0.9%	−1.9%	−3.3%	−0.4%	−1.0%	−14.0%
1971	NA	0.8%	0.8%	0.7%	0.8%	−0.9%	−1.9%	−3.5%	−0.4%	−1.0%	−26.0%
1975	NA	0.2%	0.3%	0.2%	0.2%	−0.3%	−0.7%	−1.2%	−0.1%	−0.3%	−4.2%
1979	NA	0.2%	0.1%	0.2%	0.3%	−0.2%	−0.4%	−0.8%	−0.1%	−0.2%	−4.5%
1982	NA	0.4%	0.4%	0.4%	0.4%	−0.5%	−1.1%	−2.1%	−0.2%	−0.6%	−13.6%
1983	NA	0.6%	0.5%	0.6%	0.6%	−0.7%	−1.4%	−2.7%	−0.3%	−0.8%	−19.1%

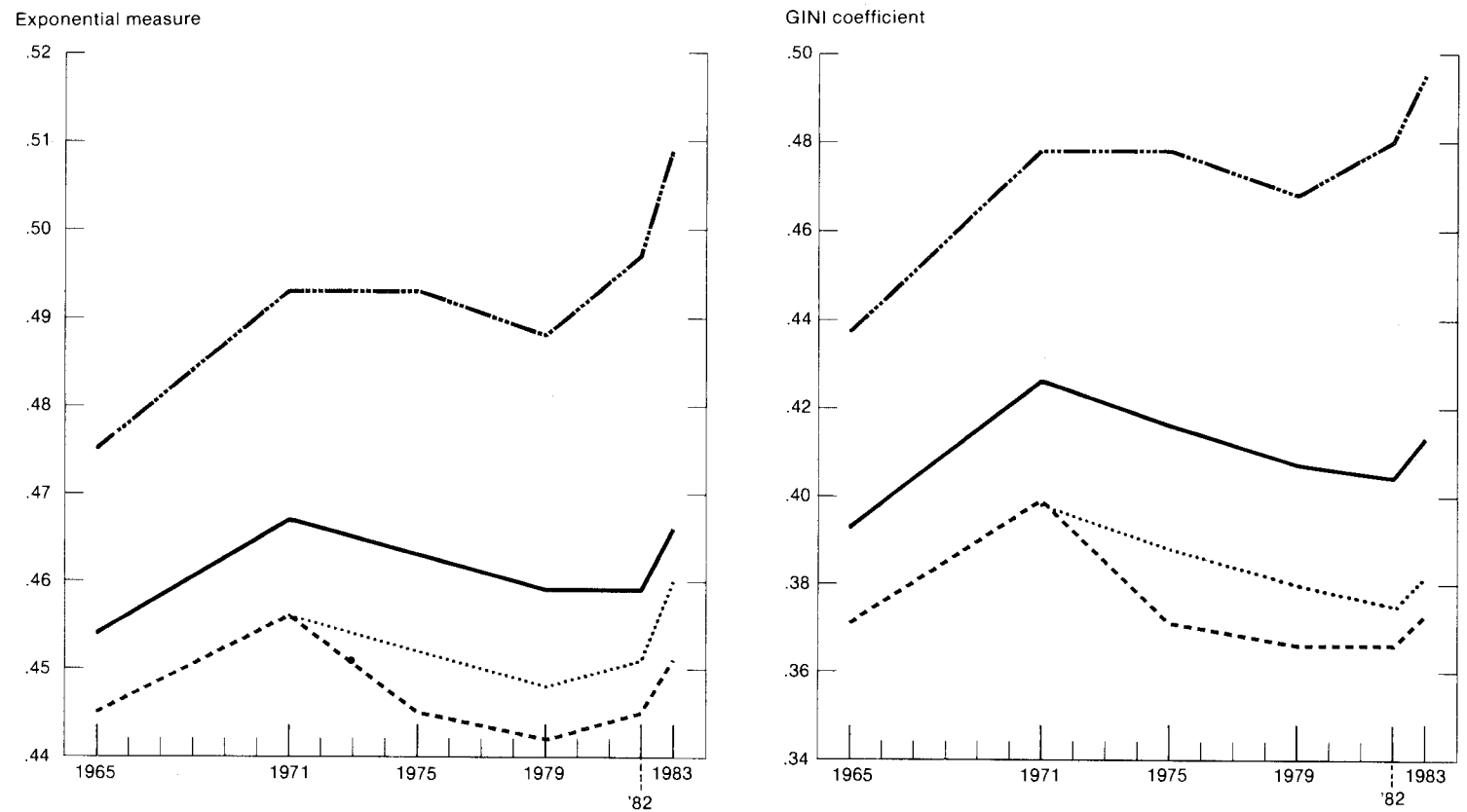
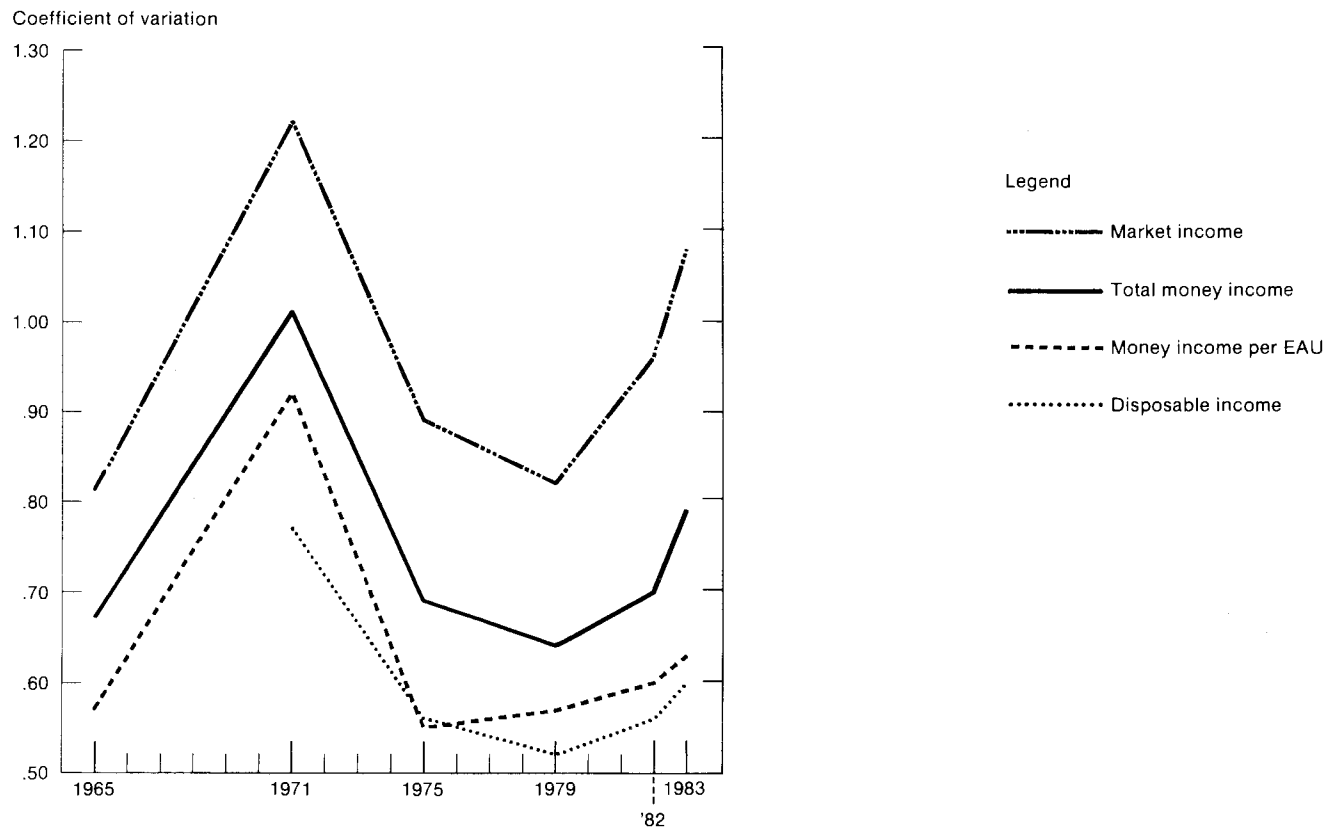


Chart 3. Income Inequality Trends, Three Measures, Three Income Concepts, Two Ordering Principles (Six Years)


Coefficient of variation
1.30
1.20
1.10
1.00
.90
.80
.70
.60
.50
1965
1971
1975
1979
1983
'82
Legend
Market income
Total money income
Money income per EAU
Disposable income

current conventional wisdom is largely correct—the shape of the distribution of total money income has not changed appreciably in the last two decades.

Disentangling—The Standardization Approach

In order to assess the second hypothesis, that various trends that would otherwise have had a significant impact on income inequality have in fact tended to cancel each other out, techniques of standardization will be applied. These techniques were developed and illustrated in Love and Wolfson (1976), and have been applied, for example, in Horner and MacLeod (1980).

The basic idea of standardization is to pose a series of hypothetical and admittedly mechanical questions. For example, what would the 1983 distribution of income have been like if the age structure of the population were reweighted to reflect that in 1965? If, with such a reweighting or standardization, the hypothetical and artifically reconstructed distribution has a noticably lower degree of inequality, we can then suppose first that shifts in age structure have been of significant magnitude, and second that they tended to increase inequality directly. Of course, this technique cannot be used to draw any conclusions about the indirect effects, for example, of the baby boom age cohorts entering the labour force and depressing the relative wages of young workers.

The analysis reported here will be based primarily on five standardizations:

- age structure,
- family type,
- family type and age structure,
- family type and effective labour force participation, ELFP, and
- total money income composition.

(The categories are the same as those shown in Tables 1 and 2 above.) ELFP is not considered by itself because the six categories are so closely bound up with the family type categories.

As already illustrated in the charts and tables above, these variables have shown significant trends or variations over the 1965 to 1983 period. Thus, we might expect the standardization process to result in considerably different degrees of measured income inequality.

In order to be precise about the standardization methodology being employed, the following formal notation will be used:

Let

$f(y; t, m)$ = the normalized distribution of income in year t for population sub-group m, where a normalised distribution has been vertically and horizontally scaled so that mean income and total population both equal one. (Recall that such scaling does not affect measured inequality.)

$p(t, m)$ = the number of family units in year t for population sub-group m

$u(t, m)$ = the average family unit income in year t for population sub-group m

so that

$f(z; t, m) = (p(t, m)/u(t, m))f(y/u(t, m); \quad t, m)$ = the actual population density for the distribution of income in year t for sub-group m

and

$f(z; t) = \sum_{m=1}^{M} f(z; t, m)$ = the overall distribution of income in year t (i.e. the vertical sum of the constituent non-normalized distributions)

where m is an index ($1 \leq m \leq M$) to some disaggregation of the population—by age, family type, ELFP, or some combination thereof.

What we now have with this notation is a way to break apart the actual observed distribution of income in a given year t, $f(z; t)$, into a set of $3 \times M$ objects—$2 \times M$ scalars (the M population counts and the M mean incomes) and M "shapes" of the constituent density functions, $f(y; t, m)$.

The concept of time series standardization then involves constructing an hypothetical $f(z)$ based on a mixture of $p(t; m)$, $u(t; m)$ and $f(y; t, m)$ from various years. More precisely, let

$$f(z; i, j, k, M) = \sum_{m=1}^{M} (p(i, m)/u(j, m)) f(y/u(j, m); k, m)$$

= a hypothetical income distribution with year i populations, year j average incomes, and year k "shapes" of density functions within each sub-group where the population has been broken down into M sub-groups.

Thus, in the case where M represents the 4-way age breakdown in Chart 3, comparing $f(z; 1983, 1983, 1983, M)$ to $f(z; 1965, 1983, 1983, M)$ would be a precise way of answering the question posed at the beginning of this section.

The standardization just illustrated deals with dividing the overall population into M exhaustive and mutually exclusive sub-groups. Another facet of the distribution of income is its composition by income source. As illustrated in Table 1, this composition has changed significantly in the past two decades.

It is also possible to define a form of standardization to explore the impact of these shifts in income composition. The basic idea is to reproportion each family's income in a given year so that the composition of aggregate income matches that in some other year. For example, suppose the composition of aggregate income shifted from (88 percent, 4 percent, 6 percent, 2 percent) employment, investment, transfer, and other money income respectively in year 1 to (79 percent, 7 percent, 11 percent, 3 percent) in year 2 (recall Table 2). Then, each family unit's respective income components in year 1 could be scaled by (0.90, 1.75, 1.83, 1.5) to result in a distribution of income based fully on year 1 data except that the income composition matches that in year 2. While this is clearly a mechanical exercise, it can give an impression of the kind of impact changes in income composition have on income inequality.[6]

[6]Cowell (1984) uses a family of decomposable inequality measures. With such measures, the hypothetical standardized densities $f(z; i, j, k, M)$ for various population disaggregations would not actually have to be constructed. Inequality within each of the constituent population sub-groups could be computed, and then inequality of the standardized distribution could be computed as a function of these within group inequalities, and between group inequalities based on population shares and average sub-group incomes from other years. Thus, the analysis could be simpler. However, quintile shares are not decomposable. Nor does the decomposition work for the income composition type standardizations. Furthermore, as conjectured in Wolfson (1974) and implied by the theorems in Cowell (1984), there are no "simple" measures (i.e. additively separable) that are "nicely" decomposable and well-defined for zero or negative incomes (except the CV). For these reasons, and given the declining cost of computer processing, we proceed by actually constructing the full set of hypothetical microdata constituting the standardized distribution.

STANDARDIZATION RESULTS[7]

We begin with an example of standardization among an M-way partition of the population, letting M represent the 15-way breakdown by family type and ELFP shown in Table 2. Table 4 presents the results of a time series standardization for this 15-way breakdown of the population using the most recent 1983 data as the base year (i.e. all data are for 1983 except where explicitly noted otherwise), and the conventional ordering principle.

The top third of the table shows the impact of the shifting population distribution among the 15 population sub-groups over the period 1965 to 1983. Virtually all the inequality indicators and measures show a modest but clear monotone trend of increasing inequality as later years' population compositions are used. This trend is most pronounced in the 1965 to 1975 period. Given that the main factors affecting the composition of this population disaggregation have been the "unbundling" of the baby boomers, increasing female labour force participation, and higher rates of separation and divorce, the results at the top of Table 4 would seem to imply that these factors have tended to increase income inequality.

It should be emphasized that even if unbundling has tended to increase measured inequality, this need not imply that overall well-being or social welfare has declined. Young people with low incomes living on their own may still be better off then if they had to live with their parents because their incomes were even lower.

Compared to the top part of Table 4, the trends in the middle part show an increase over the 1965 to 1975 period, then a somewhat more pronounced decline in inequality to 1982, and a smaller upturn in 1983. This suggests that shifts in average incomes among the 15 population sub-groups, particularly in the 1975 to 1982 period, have tended to be equalizing. Inspection of the underlying data indicates that the "no earners" groups (mainly unattached individuals and couples without children, recall Table 2) which have below average incomes had increasing relative mean incomes in the later period, while above average income family groups with earners either had flat earnings after 1975 or experienced relative declines.

Finally, the bottom third of Table 4 shows a series of standardizations where only the shapes of the 15 within-group density functions are allowed to vary. These data show the same general trend as overall inequality—rising from 1965 to 1971, falling to 1975 or 1979, then generally rising through to 1983. The implication thus seems to be that overall trends in the shape of the income distribution permeate and are mirrored in the shapes of the distributions of constituent sub-groups, at least in the 15-way family type by ELFP breakdown being used here.

The data in Table 4 use a single year, 1983, as the base. However any of the six years could be taken as the base. The sensitivity of the standardization results to the choice of base year was examined and it was found that all six trend

[7]It should be noted that the sampling concerns noted earlier are much less significant for the standardized inequality trends, except where it is the shapes of the density functions that are varying over time.

TABLE 4

STANDARDIZED INEQUALITY TRENDS, FAMILY TYPE AND ELFP, 1983 BASE YEAR

Year	Income Share within Quintiles					Top Decile Income Share	Top Vingtile Income Share	Inequality Measures		
	First	Second	Third	Fourth	Fifth			EXP	Gini	CV
a. Population shares										
1965	4.4%	10.8%	17.3%	24.7%	42.7%	26.3%	16.1%	0.456	0.387	0.67
1971	4.1%	10.1%	17.0%	25.0%	43.9%	27.0%	16.5%	0.463	0.404	0.73
1975	4.0%	9.8%	16.8%	25.1%	44.4%	27.3%	16.7%	0.465	0.411	0.76
1979	4.0%	9.8%	16.7%	25.1%	44.4%	27.3%	16.7%	0.465	0.411	0.77
1982	3.9%	9.7%	16.7%	25.1%	44.6%	27.4%	16.7%	0.465	0.414	0.79
1983	3.9%	9.6%	16.6%	25.2%	44.6%	27.3%	16.6%	0.466	0.413	0.79
b. Relative Mean Incomes										
1965	3.4%	9.2%	16.8%	25.7%	44.8%	27.4%	16.6%	0.470	0.423	0.79
1971	3.3%	9.1%	16.7%	25.7%	45.2%	27.6%	16.7%	0.473	0.427	0.82
1975	3.3%	8.9%	16.6%	25.6%	45.6%	27.9%	16.9%	0.474	0.431	0.84
1979	3.5%	9.2%	16.6%	25.4%	45.2%	27.7%	16.8%	0.471	0.423	0.82
1982	4.0%	9.8%	16.7%	25.1%	44.4%	27.2%	16.5%	0.466	0.410	0.77
1983	3.9%	9.6%	16.6%	25.2%	44.6%	27.3%	16.6%	0.466	0.413	0.79
c. Shapes										
1965	3.5%	10.0%	17.1%	25.5%	43.9%	26.8%	16.3%	0.460	0.411	0.67
1971	3.4%	9.6%	16.8%	25.3%	44.9%	27.8%	17.4%	0.465	0.424	0.92
1975	3.9%	10.2%	17.1%	25.3%	43.5%	26.6%	16.3%	0.457	0.405	0.63
1979	3.9%	9.9%	17.1%	25.5%	43.6%	26.5%	16.0%	0.457	0.408	0.62
1982	3.8%	9.8%	16.8%	25.2%	44.4%	27.3%	16.7%	0.462	0.415	0.73
1983	3.9%	9.6%	16.6%	25.2%	44.6%	27.3%	16.6%	0.466	0.413	0.79

lines moved quite closely in parallel. Thus the choice of base year is not particularly significant, so that 1983 has been taken as the base year in subsequent charts.

We turn now to the core of the standardization analysis with the results shown in Charts 4.1 and 4.2. (Note that the origins of the vertical axes are again not at zero, so apparent trends or fluctuations are accentuated.) The charts show the relative impacts of the four alternative population disaggregations—age (A), family type (FT), family type by age (FT-A), and family type by ELFP (FT-ELFP)—and the income composition (IC) standardization. The charts show respectively standardizations for population shifts, relative mean income shifts, and shape or within-group inequality trends for the population breakdown types of standardization. The IC standardization results are repeated in all three sets of graphs. The first chart displays four graphs in order to capture variations in the trends revealed by the three inequality measures, and for the Gini coefficient the sensitivity to the ordering principle. In turn, each of the four graphs shows five curves corresponding to the four standardizations for different population disaggregations and the one for income composition.

We start with the population share standardizations for the conventional ordering principle in Chart 4.1 (parts a, b, and c). It should not be surprising, given the somewhat more stable trends in the age structure as compared to family type composition in Table 1, that the family type (FT) standardization shows a more pronounced trend than the age structure (A) standardization, though mainly in the 1965 to 1975 period. The combined 16-way FT-A standardized inequality trend is very similar to that by family type alone but somewhat less pronounced. The comparison among these three curves thus implies first that age structure changes have had less impact than shifts in family types, and second that if anything the age structure changes have tended to offset slightly the effects on income inequality trends of shifts in family types.

Comparing the 15-way FT-ELFP grouping to the other three population groupings, particularly for the Gini and CV (parts b and c), it is apparent that ELFP trends, again mainly in the 1965 to 1975 period, have had an impact. The FT-ELFP curve shows a larger upward trend than the family type (FT) only curve, implying that ELFP changes reinforce the impacts of family type changes. Furthermore, comparing the FT-A and FT-ELFP curves, ELFP changes appear more significant than age structure. However, the differences among the FT, FT-A, and FT-ELFP curves are less noticeable for the EXP measure (part a). This suggests that the incremental importance of either age or ELFP in the population share standardization is small once shifts in the population amongst family types has been taken into account for trends in income inequality at the lower end of the income spectrum. Since the FT-ELFP curves correspond to the top part of Table 4 which has already been discussed, the interpretation is the same—shifts in the composition of the population toward more single parent families and unattached individuals, and increasing ELFP among spouses—more "modern" families—are associated with increased income inequality.

Chart 4.1 also displays a standardization by overall income composition (IC). All three inequality measures indicate a general downward trend; later years' patterns of income composition result in lower income inequality. This

TABLE 5.1
INCOME COMPOSITION TRENDS BY TOTAL MONEY INCOME QUINTILE
(Percentages)

Year	1965	1971	1975	1979	1982	1983
Employment						
first	32.8	27.1	21.5	23.9	23.2	22.1
second	75.5	62.2	58.4	60.3	52.1	48.7
third	91.3	86.9	83.2	83.6	76.1	75.0
fourth	93.7	92.2	90.3	89.6	85.3	86.3
fifth	92.6	91.2	91.4	89.1	85.3	87.3
Total	88.6	86.1	84.2	83.1	77.9	78.7
Investment						
first	6.1	6.1	6.7	7.2	6.0	4.6
second	5.3	6.7	7.2	8.1	9.3	8.1
third	2.2	3.9	4.5	5.0	7.4	6.1
fourth	1.9	3.0	2.8	3.9	5.6	4.3
fifth	4.6	5.6	4.5	7.1	9.4	7.8
Total	3.6	4.7	4.4	6.0	8.0	6.6
Transfers						
first	56.5	62.7	67.0	64.1	66.0	68.6
second	14.8	24.9	28.1	25.5	32.2	36.0
third	4.9	6.1	9.2	8.3	12.3	13.8
fourth	3.4	3.1	5.3	4.6	6.6	6.7
fifth	1.8	1.6	3.0	2.3	3.0	2.9
Total	6.1	6.8	9.2	8.4	10.9	11.4

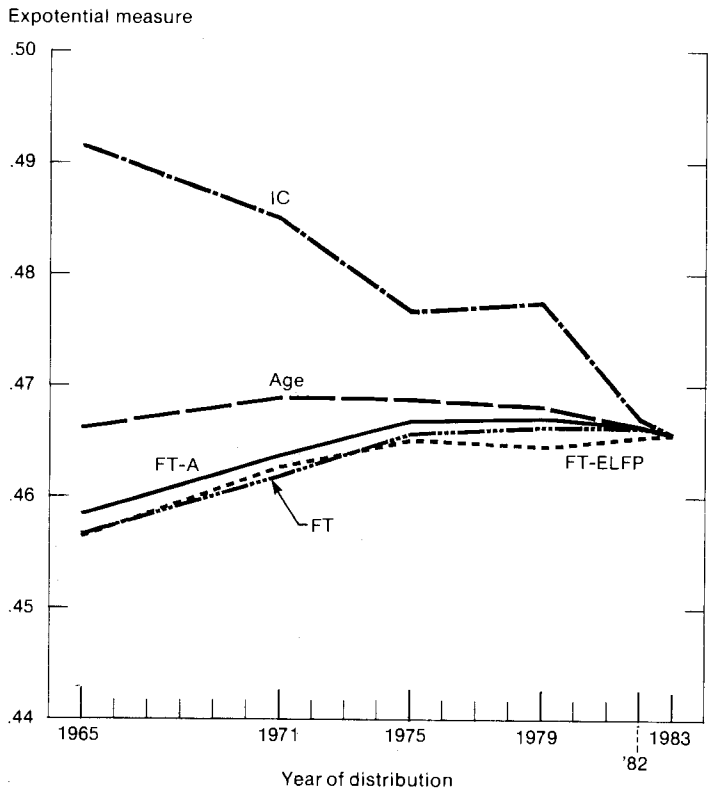
trend is opposite to that shown in the population standardizations, in particular by family type and ELFP, and considerably stronger.

As shown in Table 2, the main changes in overall income composition have been a 50 percent increase in the relative importance of government transfers, almost a doubling of investment income, and a corresponding decline in the role of employment income from 88.6 percent to 78.7 percent of total money income. The equalizing impact of this shifting income composition may be somewhat counter-intuitive: Employment income is generally thought to be more equally distributed than investment income, so that a shift from employment to investment income might be expected to be disequalizing.

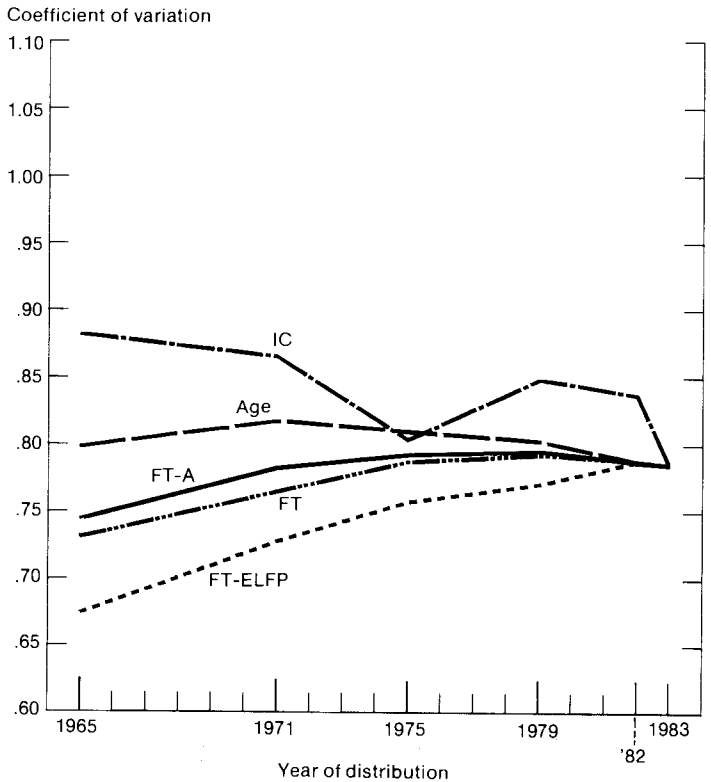
However, employment income is concentrated among the top three quintiles, as shown in Table 5.1, though the decline in its overall importance was sharpest in the second quintile. As well, except for the top quintile, investment income is generally progressively distributed.[8] As shown in Table 5.2, this is due mainly to the relatively large share accruing to the elderly. Finally, government transfers which have increased in relative importance are progressively distributed, though it is interesting to note that their shares increased relatively more in the second and third quintiles than in the first quintile. Given that government transfers and

[8]It should be recalled that investment income as conventionally defined is quite seriously under-reported. Furthermore, it is overstated to the extent that nominal interest receipts exceed real interest income. It is also understated, particularly among the wealthy, to the extent accrued but not realized interest income and capital gains are not measured, and indirectly received investment income in holding companies and trusts is not included. Finally, imputed rental income is not included.

a. Exp. conventional



b. CV, conventional



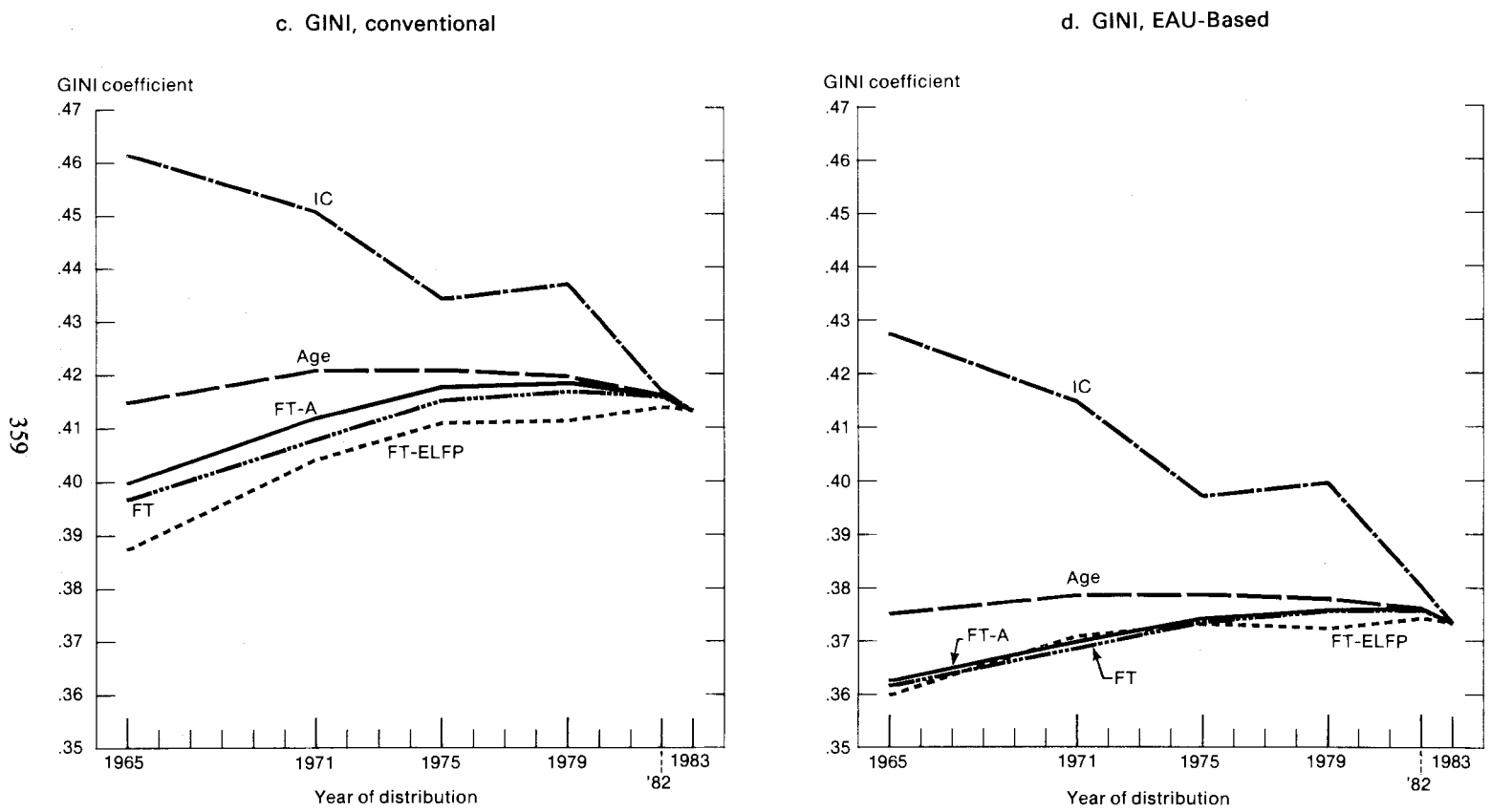


Chart 4.1. Four Population Share—And One Income Composition—Standardized Inequality Trends, 1983 Base Year

TABLE 5.2

INCOME COMPOSITION TRENDS BY AGE GROUP

(Percentages)

Year	1965	1971	1975	1979	1982	1983
Employment						
young	97.8	95.3	92.5	91.5	86.7	87.0
early middle	94.6	94.0	92.2	92.1	88.5	89.4
late middle	90.8	88.7	86.7	86.2	81.5	81.3
elderly	44.0	34.7	30.2	26.0	20.7	22.8
Total	88.6	86.1	84.2	83.1	77.9	78.7
Investment						
young	0.1	0.2	0.6	1.8	2.4	0.8
early middle	1.5	1.6	1.7	3.0	3.4	2.5
late middle	4.3	5.7	5.2	6.4	9.0	8.2
elderly	13.8	18.0	17.4	21.1	26.0	20.0
Total	3.6	4.7	4.4	6.0	8.0	6.6
Transfers	6.1	6.8	9.2	8.4	10.9	11.4
young	1.6	3.3	6.2	5.4	9.8	11.5
early middle	3.4	3.5	5.5	4.2	7.1	7.1
late middle	3.5	3.6	6.0	5.2	6.4	6.8
elderly	33.4	35.6	40.9	40.8	40.5	44.0
Total	6.1	6.8	9.2	8.4	10.9	11.4

much of investment income are more progressively distributed than employment income (except in the upper tail of the distribution), the income composition standardization results in Chart 4.1 should not be surprising—shifts in income composition have tended to be equalizing.

As shown in part d of Chart 4.1, the conclusions just drawn regarding age, family type, and income composition seem generally robust with respect to the choice of the ordering principle. After adjusting for family size using EAUs, the FT curve shows a more pronounced trend than the age curve, and the stronger and opposite trend in the IC curve is the same as with the conventional ordering principle. However, the FT, FT-A, and FT-ELFP curves are almost coincident. Thus, the incremental contributions of the age and ELFP breakdowns given the family type disaggregation appears almost negligible. The cause of this result is not clear.

Turning next to relative mean income standardizations, these are shown in the top half of Chart 4.2 for the Gini coefficient. Except for the IC standardization which is repeated from Chart 4.1, the standardized inequality trends appear more humped than monotone up or down, with the peak in 1975 for the conventional ordering principle. As in the case of the population share standardizations in Chart 4.1, the 15-way FT-ELFP breakdown gives the most pronounced trends in the standardized inequality measures, though in this case it is the most humped trend rather than the trend showing the largest increase. Unlike Chart 4.1, this time it is the FT, A, and FT-A curves that are almost coincident.

An explanation of the humped patterns for these relative mean income standardizations based on inspection of the underlying data appears to be the

following: Increased relative mean incomes among families compared to unattached individuals and among middle versus young and elderly age groups which occurred mainly in the 1965 to 1975 period were disequalizing, while increasing relative mean incomes of the "no earners" groups which occurred mainly in the 1975 to 1983 period and were presumably attributable to increased transfer payments were equalizing.

The bottom half of Chart 4.3 shows a series of the third type of population group standardizations. These focus on the changing shapes of the constituent income distribution density functions, the within-group inequality trends, for the four population disaggregations as well as repeating the IC standardization. The conclusion to the third part of Table 4 appears to stand: overall trends in inequality are mirrored in the constituent distributions for both a range of base years and a variety of disaggregations.

Finally, the two EAU-based standardizations shown in Chart 4.2 suggest that the conclusions with respect to the relative mean income, shape, and income composition standardizations are robust with respect to the choice of the ordering principle.

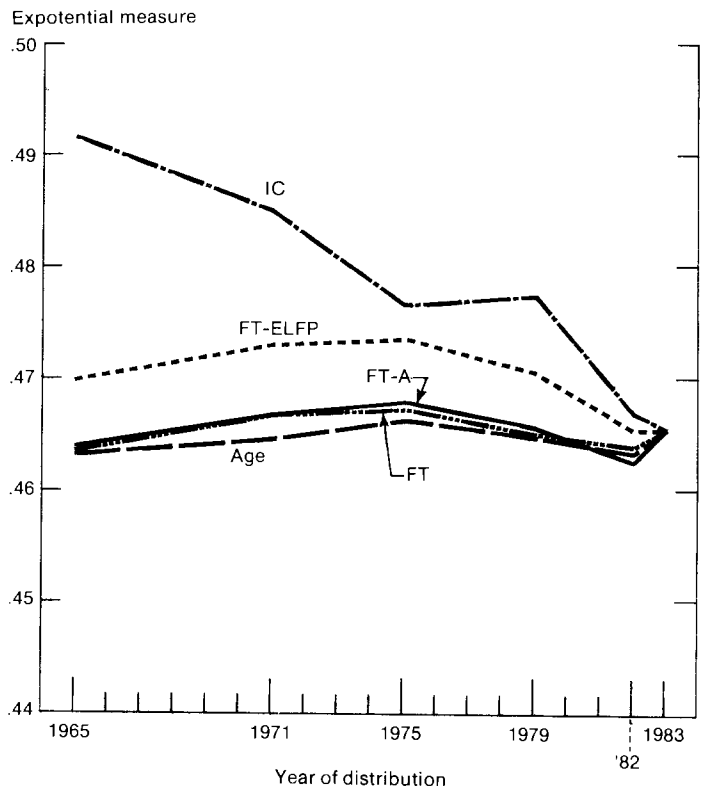
Working Women and Inequality

The standardization results, particularly for the FT-ELFP breakdown in Chart 4.1, appear at least in part contrary to the general view cited at the outset that increasing numbers of women entering the labour force have had an equalizing impact. However, the impact of increasing female labour force participation is confounded with other factors in the FT-ELFP population share standardization.

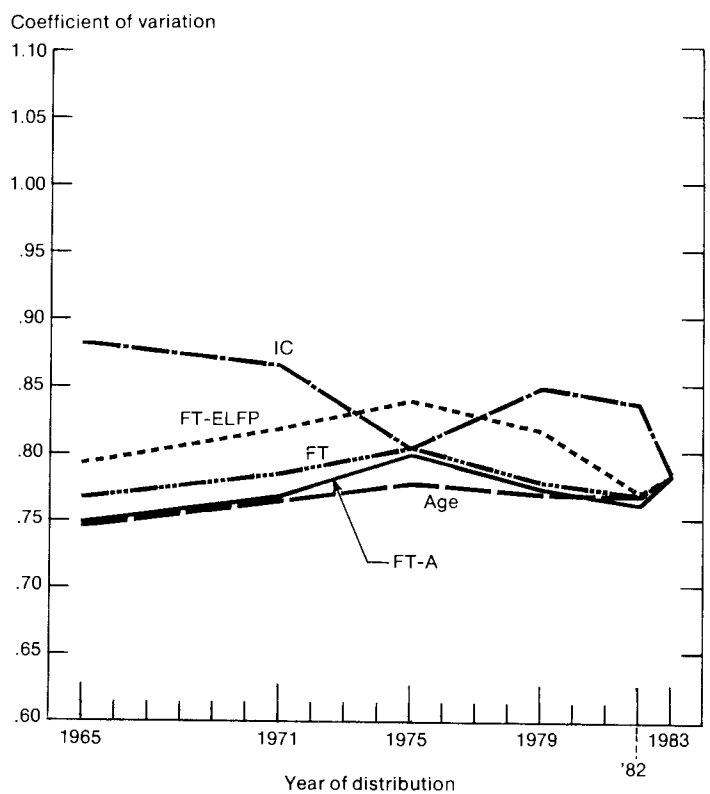
In order to check the role of increasing female labour force participation in isolation of other family type and ELFP trends, a set of hypothetical distributions was constructed for each of the six data years. In these distributions, the employment incomes of the lower income spouses in "modern" couples were arbitrarily halved. The results of this simulation experiment are shown in Table 6 where the percentage change in each inequality indicator or measure is given. The results clearly show that increased second earner (mostly women) employment incomes are *dis*equalizing, more so in later years when there are more women ELF participants. This is in direct contrast to the Horner and MacLeod (1980) result that increased female labour force participation has been somewhat equalizing.

This result can be explained by two main factors. First even amongst "modern" couples (with or without children), the underlying data show that increased incomes of second earners are generally disequalizing, particularly in the lower and middle income ranges (contrary to Swidinsky (1983) who found a generally neutral impact on inequality). Second, "modern" couples have above average incomes, so any increase in average incomes for this group is disequalizing overall. As a final point, the experiment reported in Table 6 simplistically assumes proportionate changes in second earner employment incomes, even though in fact women entering the labour force have almost certainly not done so in such a smooth pattern. However, the results are generally robust for all the inequality statistics and all six base years. Thus, some account has been taken in the

Exp, conventional



CV, conventional



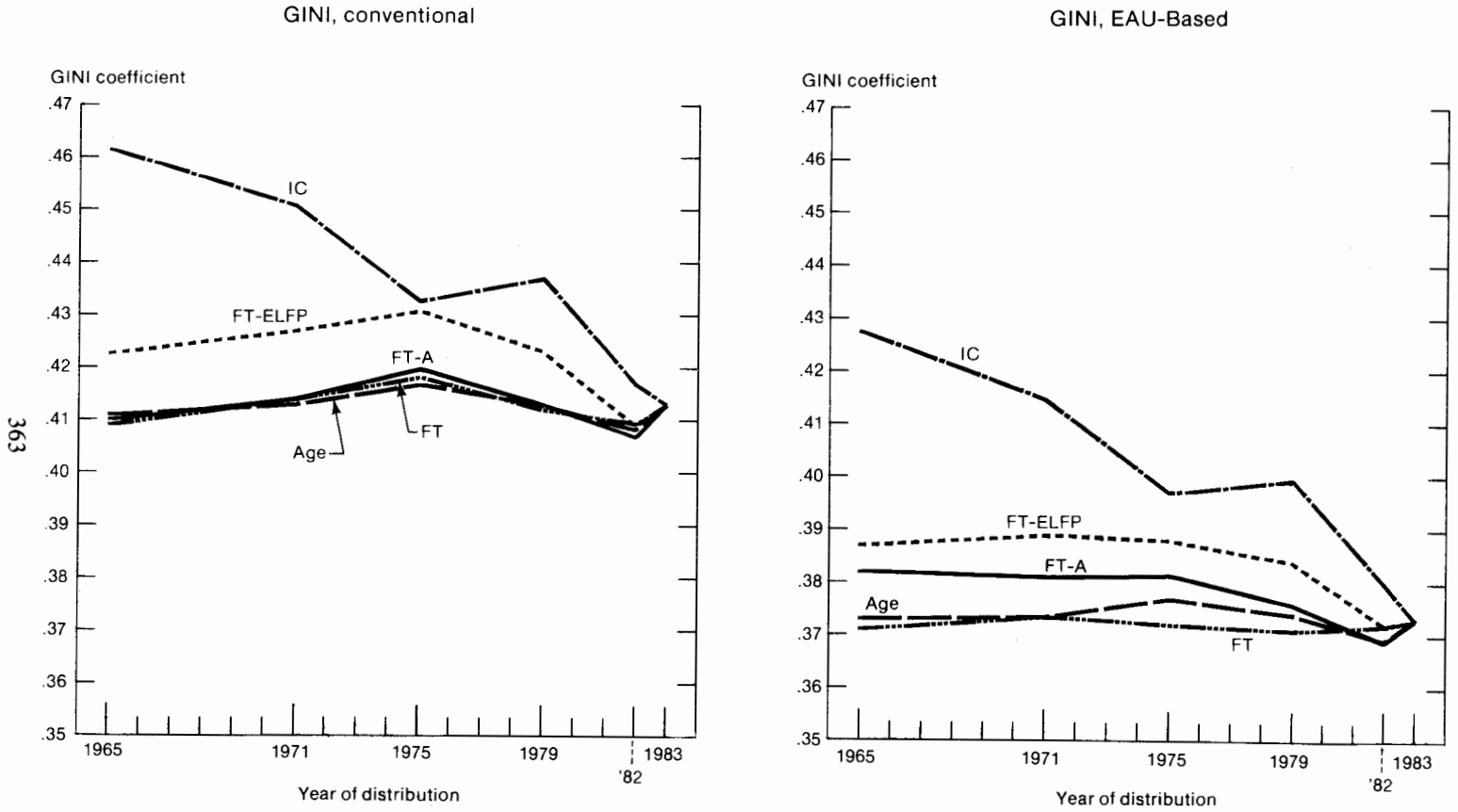
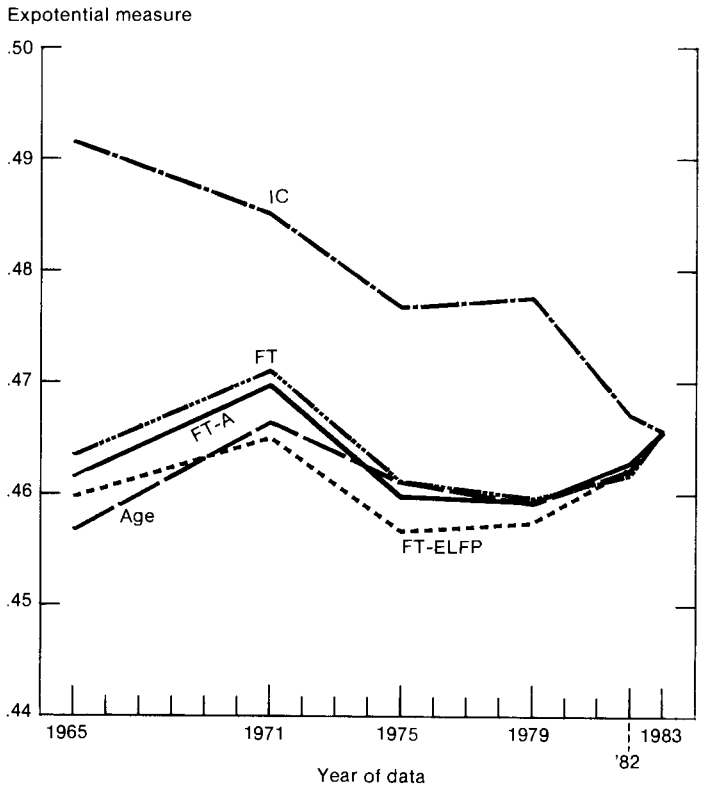
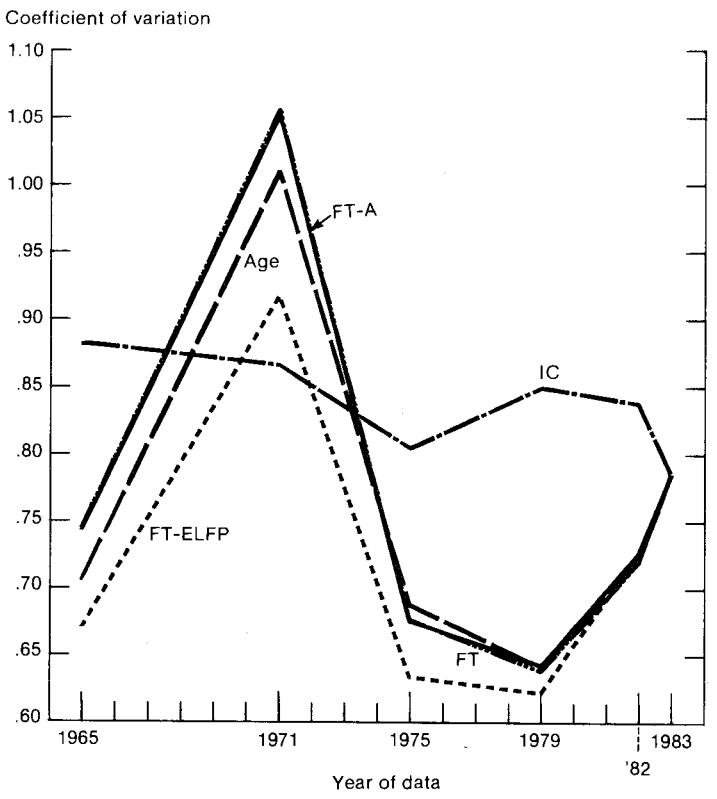


Chart 4.2. Four Relative Mean Income- and One Income Composition-Standardized Inequality Trends, 1983 Base Year

Exp, conventional



CV, conventional



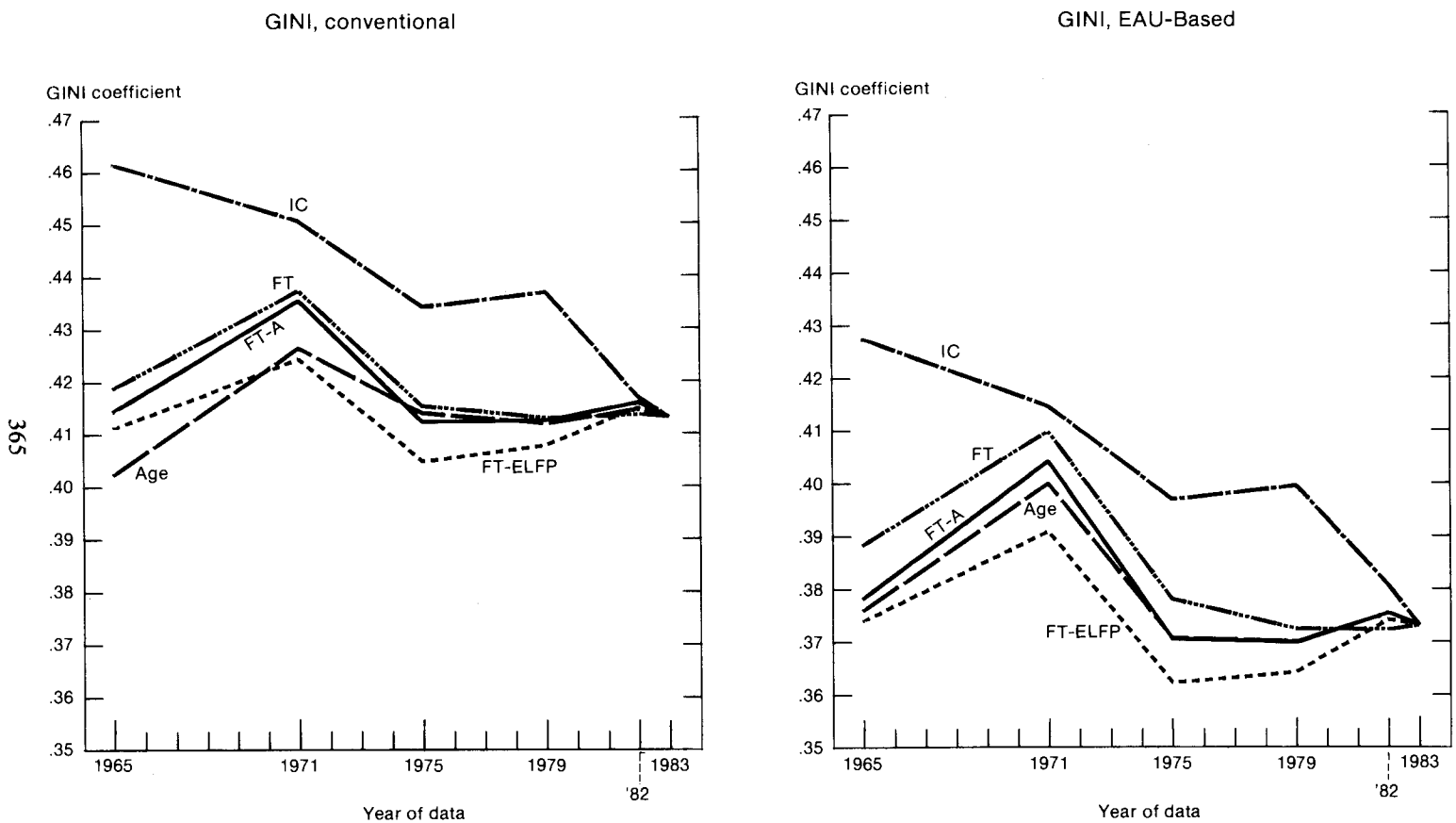


Chart 4.3. Four Shape- and One Income Composition-Standardized Inequality Trends, 1983 Base Year

TABLE 6

IMPACT ON INCOME INEQUALITY OF HALVING EMPLOYMENT INCOMES OF LOWER INCOME SPOUSES IN MODERN FAMILIES

	Income Shares (Percentages)							Inequality Measures		
	Quintiles					Top	Top			
Year	1st	2nd	3rd	4th	5th	Decile	Vingtile	EXP	Gini	CV
1965	3.5	2.6	1.4	−0.9	−1.0	−0.2	0.8	−0.5	−1.5	0.3
1971	1.3	1.2	0.3	−0.6	−0.2	0.2	0.7	−0.1	−0.4	1.1
1975	5.5	4.5	2.1	−1.1	−1.6	−0.8	0.4	−0.8	−2.3	−1.8
1979	5.8	4.7	2.3	−0.9	−1.9	−1.4	−0.5	−0.9	−2.8	−3.2
1982	6.4	4.8	2.2	−0.6	−2.2	−1.8	−0.8	−1.0	−3.1	−2.1
1983	6.7	5.2	2.6	−0.3	−2.5	−2.3	−1.7	−0.8	−3.3	−5.9

experiment of the actual shifting pattern of second earners over the past two decades.

ECONOMIC FACTORS, "TRICKLE DOWN" AND THE "CRUELEST TAX"

The standardization results are also of interest in connection with the issue of the distributional implications of macro-economic policy. For example, Blank and Blinder (1985) have recently reconsidered this question and their conclusions reinforce the earlier U.S. literature that increases in unemployment are considerably more regressive than increases in inflation; inflation they conclude is *not* "the cruelest tax". These analyses were based on time series regressions of decile shares of the overall distribution on macroeconomic variables, particularly the unemployment and inflation rates.

In the context of this analysis, the search for macroeconomic correlates of shifts in income distribution is more problematic. The first reason is that the Canadian income distribution is generally stable over time, as already discussed in connection with Chart 1. In contrast, Charts 2.1 and 2.2 show that the rate of change of the CPI more than quadrupled over the period, the unemployment rate has more than tripled, the annual rate of real *per capita* GNE growth has ranged from more than 5.5 percent in 1971 to less than −5.5 percent in 1982, and Table 1 shows that the proportion of one-earner couples with children dropped by over 60 percent. Thus, variations in the distribution of income are quite small relative to the variations in other key variables.

Furthermore, some of the variations in overall inequality are of the same order as or smaller than the variations in standardized distributions. Thus, instead of searching for the statistical correlates of what appear to be fairly small variations in income inequality over time, as in the Blank and Blinder style econometric analysis, we can use the standardization experiments to try to draw out the inter-relationships. The picture that emerges is more involved than in the Blank and Blinder analysis because, as we have already seen, socio-demographic factors are important and the impacts of cyclical macroeconomic variables like the unemployment and inflation rates have to be traced through to their effects on family units' incomes.

Following Blank and Blinder, consider first the role of changes in the unemployment rate over time. Table 5.2 above shows the trends from 1965 to 1983 in income composition by age group. While the tripling of the unemployment rate is almost certainly associated with the decline in the relative share of employment income, Table 5.2 shows that the sharpest decline in this income source was amongst the elderly. In turn, the decline in labour force participation among the elderly is probably more strongly associated with improvements in public pensions than with weakness in labour market demand. Also, despite the increase in unemployment, Table 1 shows no significant trends in the sizes of the "no earner" ELFP groups over time, except single parents. In fact, with the shift from one-earner to two-earner couples, the overall proportion of working age adults with employment income has increased. This suggests that weak labour market demand as reflected by the very sharp increase in the unemployment rate has been less significant in determining ELFP than the drop in fertility and the related increase in female labour force participation rates.

The other expected correlate of increases in the unemployment rate is increased government transfers, primarily through unemployment insurance (UI), but also to some extent through social assistance (welfare)—both directly to those unemployed who have exhausted their UI benefits and to single parents insofar as the increased divorce and separation rates are a result of high unemployment (as well as a fundamental shift in societal values). While the greatest increase in government transfers accrued to the elderly, more disaggregated data underlying Table 5.2 indicate considerable growth within the second quintile of the young and early middle age groups. This may be linked to the much higher youth unemployment rates of recent years, and the relatively high labour force growth rate as the baby boom cohorts entered working age.

The channels by which inflation affects income distribution, the other main macro variable examined in the Blank and Blinder style analysis, are much more obscure. Certainly as shown in Charts 2.1 and 2.2 there is no clear link between inflation rates and *per capita* real GNE growth, interest rates, or real average wage rates, three variables which at least intuitively have more direct links to family incomes. (We do not consider the impact inflation has in inflicting capital losses on holders of dollar denominated assets, nor in causing serious mis-statements of income from capital—due to lack of sufficient data.) Thus, these three variables rather than inflation itself will be examined in turn.

Strong real economic growth is associated with low rates of unemployment, and the links with unemployment rates have just been discussed. It is also associated with the "trickle down" hypothesis—in the rising tide of economic good times, not only the large boats of the rich but also the small boats of the poor are raised. Perhaps the main manifestation of the trickle down view in the period being examined is not one that operated simply through private markets. Rather in the mid- to late-1960s, it was through the political process. The relatively strong economy provided the political backdrop for the introduction and major enhancement of social transfer programs. In the autumn of the post-World War II growth boom (viewed retrospectively), Canada introduced major new public pension programs, major reforms of UI and social assistance, and automatic CPI indexing for many major transfers. While Table 2 shows growth in government

transfers still continuing after the slowdown and stagnation in real economic growth starting in the mid-1970s, this was largely endogenous. Partly it was the automatic response of income-tested programs such as UI, social assistance, and part of the pension system to declines in market sources of income, and partly it was the juxtaposition of CPI indexed transfers to declines in real average wages starting in the late-1970s.

The main impact of high nominal interest rates, the second channel by which inflation can influence household incomes and hence inequality, is on investment income. The relationship between the interest rate in Chart 2.2 and the relative share of investment income in Table 2 is quite clear. However, as shown in Tables 5.1 and 5.2, a substantial portion of the increase in nominal interest income associated with recent high rates of interest has accrued to lower income groups, particularly the elderly, subject of course to all the caveats already noted.

Finally, the more recent decline in real average wage rates as shown in Chart 2.2, as with the higher unemployment rates, is associated with a decline in the share of employment income in total income. As already discussed, and perhaps counter-intuitively, this has been equalizing.

Provisional Conclusions

This analysis started by questioning the conventional wisdom that income inequality has remained virtually unchanged in Canada in the post-World War II period. A closer look at the data tended to support this apparent stability, particularly in contrast with social trends such as increasing divorce and separation rates and female labour force participation, and economic fluctuations as reflected in such measures as rates of inflation, unemployment, real growth, and interest.

To understand this paradox of general stability in income inequality in the face of major social and economic trends, the technique of standardization as developed by Love and Wolfson (1976) was applied to detailed income distribution micro-data for six years over the period 1965 to 1983. The standardization analysis was applied first to assess various breakdowns of the population, specifically by age, family type, and effective labour force participation (ELFP) group, then to the role of trends in the composition of income.

In the case of population groups, the most significant trends in income inequality were associated with changes in the numbers of family units broken down by family type and effective labour force participation (ELFP). Changes in age structure were not as important. The changes in the composition of the Canadian population by family type and ELFP (e.g. single parents, two-earner couples) in turn mainly reflected lower fertility rates, increased female labour force participation, increased divorce and separation rates, and more baby boom children living apart from their parents. These trends by themselves would have increased income inequality. A further more detailed analysis suggested that increased female labour force participation has had a disequalizing impact, perhaps contrary to conventional wisdom.

The result from standardizations relating to income composition was opposite to the population share standardizations. The decline in the role of employment

income and the increasing role of investment and government transfer income were equalizing. Thus, increasing unemployment rates, tight money in so far as it has caused high interest rates, and stagnant economic growth have not had a serious adverse impact on income inequality; quite the contrary. With the social "safety nets" put in place in the late 1960s and their automatic responses to the weakening economy, and the substantial concentration of private savings among the elderly who have below average incomes, higher nominal interest rates and economic stagnation have been apparently equalizing.

Given the overall stability in income inequality, it might be (simplistically) concluded that the equalizing tendencies of macroeconomic factors, high interest rates and stagnant growth, have just offset the disequalizing social factors of "baby boomers" leaving home, lower fertility, higher divorce and separation rates, and higher female labour force participation.

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